

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

1. (currently amended) An overheat protection device comprising a variable resistive element for which resistance varies depending on temperature and which is a polymer PTC element, characterized in that the device further comprises a switching element which controls a current flowing through an electrical system depending on an applied voltage thereto, and a resistor having a resistance R , said electrical system comprising a secondary battery, and the variable resistive element is composed of a plurality of variable resistive elements at least some of which are electrically connected in series with each other, the variable resistive element being ~~is~~ located on and thermally combined with a certain position of the electrical system and interrupts the current flowing through the electrical system by changing the applied voltage to the switching element when the certain position comes to be under a high temperature condition, the variable resistive element having a resistance in a high temperature state P_H and a resistance in a low temperature ~~state~~ ~~statue~~ P_L , the relationship between the resistance of the variable resistive element and the resistor being $R/P_L > 10$ and $R/P_H < 1/10$.

2. (previously presented) The overheat protection device according to claim 1, wherein the variable resistive element is located on and thermally combined with the secondary battery.

3. (canceled)

4. (currently amended) The overheat protection device according to claim 1, wherein all of the ~~variable resistive element is composed of a plurality of variable resistive elements which~~ are electrically connected in series with each other.

5. (previously presented) The overheat protection device according to claim 1, wherein

the variable resistive element and the resistor are electrically connected in series with each other and in parallel to the electrical system, and

the switching element is electrically connected in parallel to the resistor.

6. (previously presented) The overheat protection device according to claim 5, wherein

the switching element is a field effect transistor (FET),
 a gate of the FET is electrically connected to a position between the variable resistive element and one end of the resistor,
 a source of the FET is electrically connected to another end of the resistor,
 the source and a drain of the FET are electrically connected to form a part of an electric circuit comprising the electrical system, and
 when a voltage between the gate and the source of the FET becomes not greater than a threshold value, the current does not substantially flow between the source and the drain of the FET so that the current flowing through the electrical system is interrupted.

7. (previously presented) The overheat protection device according to claim 6, wherein a value of the voltage between the gate and the source is expressed as formula (1):

$$V_{GS} = \frac{R}{P + R} V_0 \dots (1)$$

wherein V_{GS} is the voltage between the gate and the source, V_0 is a voltage across the variable resistive element and the resistor, P is a resistance of the variable resistive element, and R is a resistance of the resistor.

8. (canceled)

9. (canceled)

10. (previously presented) An electrical system comprising the overheat protection device according to claim 1.

11. (previously presented) The electrical system according to claim 10, wherein the secondary battery is electrically connected to an electrical element to form an electric circuit, and the overheat protection device is connected in parallel to and between the secondary battery and the electrical element.